

Maine Hurricane Evacuation Study
Hurricane Surge Inundation Maps
June 2005

Study Purpose. The purpose of the Hurricane Evacuation Study Program is to develop tools and information that will assist Federal, State and Local Emergency Management Officials in planning for and responding to hurricanes.

Funding. Hurricane Evacuation Study funds are provided by the Federal Emergency Management Agency, the U.S. Army Corps of Engineers and the States. Local community officials and agencies provide valuable data and coordination throughout the study at their own expense.

Authority. The Authority for the U.S. Army Corps of Engineers' participation in this study is Section 206 of the Flood Control Act of 1960 (Public Law 86-645). The Federal Emergency Management Agency's participation is authorized by the Disaster Relief Act of 1974 (Public Law 93-288). These laws authorize the allocation of resources for planning activities related to hurricane preparedness.

SLOSH Model. The Sea, Lake, and Overland Surges from Hurricanes (SLOSH) model was developed by the National Weather Service to calculate potential surge heights from hurricanes. The SLOSH model for the Maine Hurricane Evacuation Study was run by the Storm Surge Group, National Hurricane Center, National Centers for Environmental Prediction, National Oceanic and Atmospheric Administration, Miami Florida. Because of the large tidal range along the Maine coast, two SLOSH models were run for this study. One model calculated hurricane surge elevations assuming that peak storm surge arrived coincident with mean tide, and the other calculated hurricane surge elevations assuming that peak storm surge arrived coincident with mean high tide. The SLOSH model calculates the hurricane surge elevation that would result from over 500 combinations of hurricane category, landfall location, forward speed, and direction.

Hurricane Category. One of the earlier guides developed to describe the potential storm surge generated by hurricanes is the Saffir/Simpson Hurricane Scale, which assigns a Hurricane Category according to the maximum sustained wind speed within the hurricane. It was developed by Herbert Saffir, Dade County, Florida, Consulting Engineer, and Dr. Robert H. Simpson, former Director of the National Hurricane Center. A condensed version of the Saffir/Simpson Hurricane Scale is shown in the table below.

Saffir/Simpson Hurricane Scale	
Category	Maximum Sustained Wind Speed (mph)
1	74-95
2	96-110
3	111-130
4	131-155
5	> 155

Hurricane Surge Inundation Maps. The Hurricane Surge Inundation Maps for the Maine Hurricane Evacuation Study were prepared by the U.S. Army Corps of Engineers, New England District. These maps were developed using GIS software by overlaying the hurricane surge water surface elevations from the SLOSH model on top of ground elevations from the USGS National Elevation Dataset to show which areas would be inundated (flooded) by hurricane storm surge. For each hurricane category, the hurricane surge elevation that results from the worst-case combination of hurricane landfall location, forward speed, and direction at each location along the coast was used in preparing the hurricane surge inundation mapping. This was done for two reasons. First, it is difficult to predict in advance at what location that the hurricane will make landfall. Second, for Emergency Management Planning purposes, it is best to plan for the worst-case, and adjust Emergency Management activities based on actual conditions.

Because of the large tidal range along the Maine coast, two sets of hurricane surge inundation maps were developed. One set of maps shows the areas that would be inundated by hurricane surge assuming that peak storm surge arrived coincident with mean tide, and the other set of maps shows the areas that would be inundated by hurricane surge assuming that peak storm surge arrived coincident with mean high tide. Of the two sets of maps, the most extensive inundation is shown on the mean high tide maps. The tide scenario is printed on the bottom of each map.

The maps are divided into two folders on this CD ROM, titled "MeanTide" and "MeanHighTide". The maps were produced at a scale of 1" = 2,000'. When printed at their full size, the maps are 34" x 44". There are 31 maps that cover the entire extent of coastal Maine that could expect to be inundated by hurricane storm surge under worst-case conditions. There is also a Map Index that shows the area covered by each of the 31 maps, and also contains the map legend.

Accuracy. Users of the Hurricane Surge Inundation Maps should recognize that there are accuracy limitations inherent to each of the data sources that was used to create the maps. The SLOSH model hurricane surge elevations have an accuracy of +/- 20%. The elevation data has a vertical accuracy of approximately +/- 7' and a horizontal accuracy of approximately +/- 25'. The basemap data, such as the shoreline, roads, rivers, streams, and schools, has a horizontal accuracy of approximately +/- 25'. Therefore, the maps should be used as a general guide, rather than an absolute representation, as to which areas can expect to be inundated (flooded) by worst-case hurricane storm surge for a particular hurricane category. In addition, users should note that there may be areas that are not shown to be inundated by hurricane surge, but are in fact surrounded by hurricane surge. Those areas may become isolated by hurricane surge.

GIS Layers. Two Hurricane Surge Inundation GIS layers were developed from this effort – one each for the mean tide and the mean high tide scenarios. These layers are included on this CD ROM, and are fully documented with metadata (information on how the layers were developed).

Map Notes. Below are some general notes regarding the Hurricane Surge Inundation maps.

1. Hurricane surge elevations were determined by the National Hurricane Center using the SLOSH model (Sea, Lake and Overland Surge from Hurricanes), and assume peak hurricane surge arrives at either mean tide or mean high tide, as indicated at the bottom of the maps.
2. The hurricane surge inundation areas shown on the maps depict the inundation that can be expected to result from a worst-case combination of hurricane landfall location, forward speed, and direction for each hurricane category.
3. The FEMA 100- and 500-year flood zones are shown for reference to depict those areas beyond the hurricane surge inundation areas where coastal or inland flooding may be expected. FEMA Flood zones were not available in electronic format for Knox and Lincoln Counties.
4. Ground elevation data was obtained from the USGS National Elevation Data Set.
5. Basemap features such as roads and streams were obtained from the Maine Office of GIS, and Geographic Data Technology, Dynamap/2000. Most have a source scale of 1:24,000.